NRC License 12-00722-06 (Tritium)

- *Covers fire control devices used by US Army, Navy, and Marine Corps civilian and military personnel worldwide*
- *Inventories must be kept at the user level*
- *1 hour training at the user level*
- *4 hours training to maintenance personnel*
- *SOPs must be posted*
- *Inventory kept at installation*
- *Quarterly monitoring of storage areas*
- *Field storage limited to 200 Ci per room*
- *Baseline bioassays for maintenance personnel*

Employer Responsibility

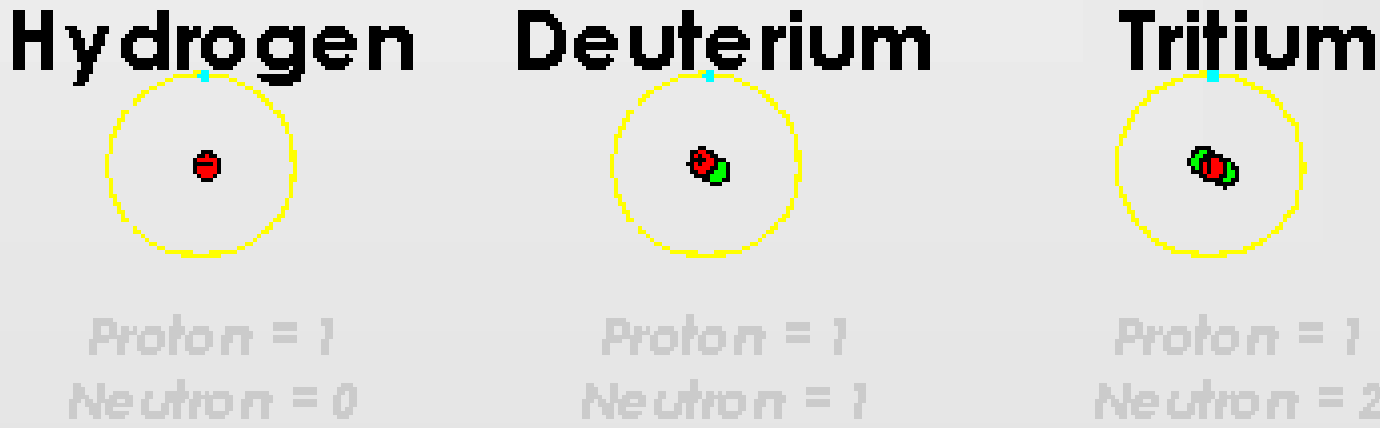
- Must comply with NRC requirements
  - NRC is empowered to:
    - Impose fines
    - Revoke or suspend the license
- Inform you of NRC requirements which apply to your job.
- Post "NRC Notices of Violation"
- Oversee local radiation protection program

Your Responsibility

- Know NRC Requirements for your job
- Report violations you observe
  - Report through your chain of command
  - You can request NRC inspection
    - Your employer can NOT prevent you from contacting the NRC directly
    - Identity can remain confidential
  - Protected by federal law from adverse actions
- Keep personal exposure ALARA

Tritium - ^{3}H

- Heaviest isotope of hydrogen
- Gas under ordinary conditions
- Low energy beta emitter
- Half Life = 12.3 years



What is it used for?

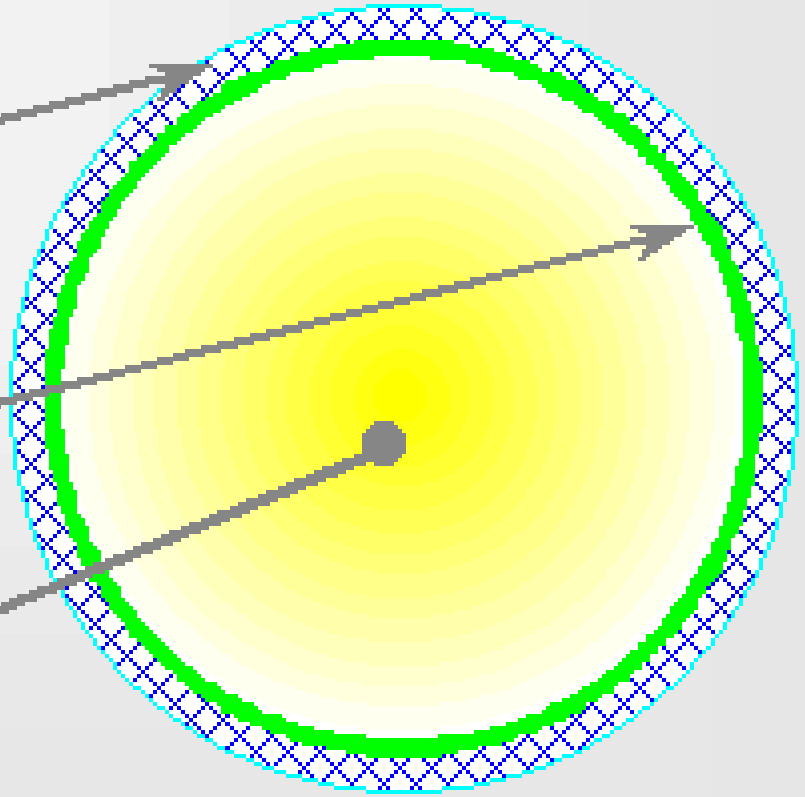
- Hydrological Studies
- Tracer for Biological Research
- Luminous Paints
- Activator in Phosphor Light Sources

Tritium Light Source

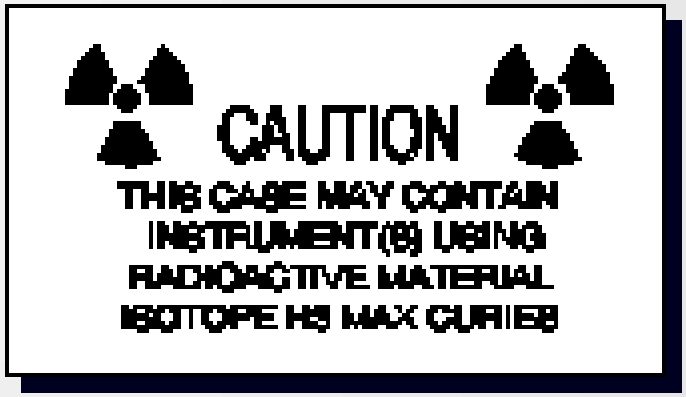
Pyrex Container

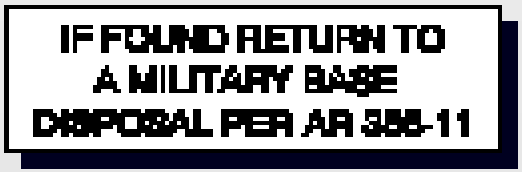
Phosphor Agent

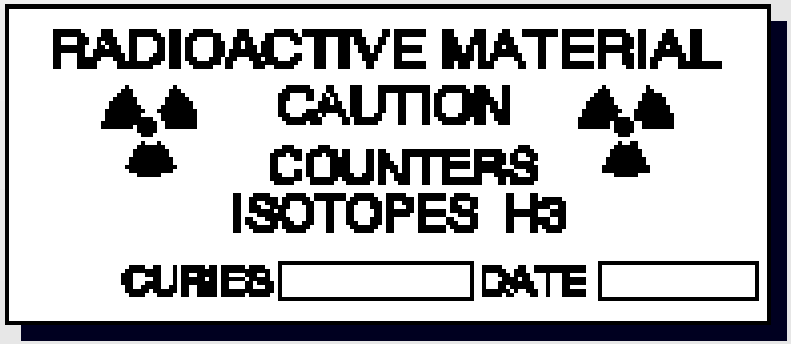
Tritium Gas



Typical Warning Plates







Tritium Storage

- Annual inventories are required
- Quarterly Wipe Test is required
- No more than 1000 Ci for supply type storage in the field
- Store in well ventilated area
  - At least 12 air exchanges per day
- No more than 200 Ci for maintenance and other storage areas in the field
- Post area

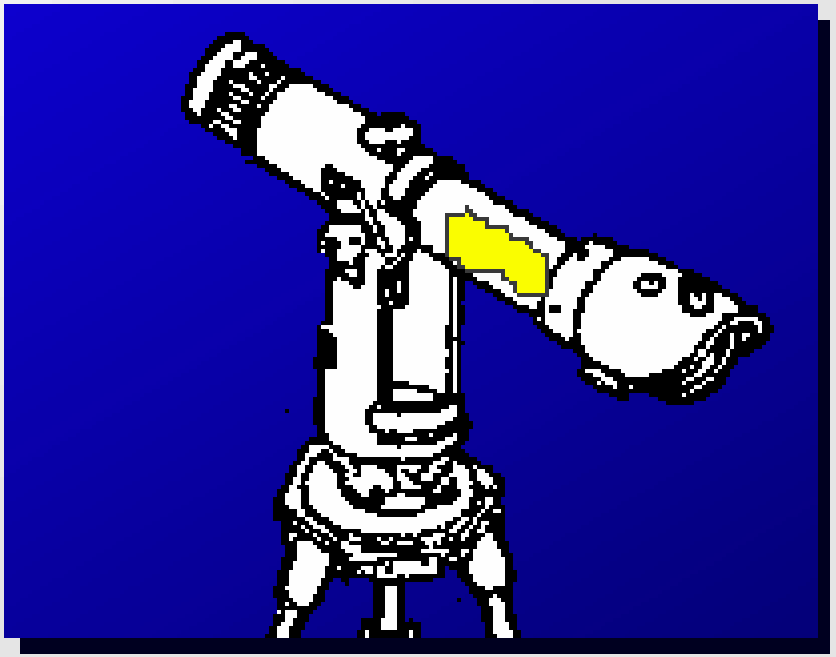
Tritium Storage

POSTING

- **Post area**
  - Caution Sign
    - "*Caution Radioactive Material*"
  - NRC Form 3
  - Energy Reoganization Act "206"
  - NO EATING DRINKING SNOKING, ETC.
  - List of where to Find
    - 10 CFR 19, 20 & 21
    - Licenses
    - Notices of Violations
    - SOP's

Tritium Hazards

- Tritium gas poses little hazard
  - Dissipates Quickly into the Atmosphere
- Oxide Tritium
  - Readily absorbed by the body
  - Chemically Identical to water
  - Plates into other material



Illumination Test

1. Place the device in a dark place

   Ensures that phosphor agent is not activated by an outside light source.

2. View to ensure proper illumination.

   Allow eyes to become accustomed to the dark.

3. If no illumination:

ASSUME THE SOURCE IS BROKEN!

Handling Damaged Devices

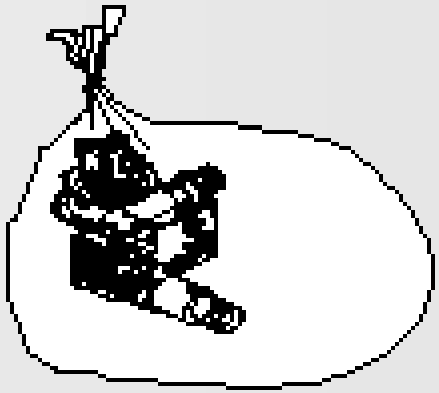
Vacate the area

Contact the local RPO or Safety Officer

- **Wash with non-abrasive soap and warm water**
- **Wear latex or rubber gloves**
- **Double bag the device**
- **Label container as "BROKEN TRITIUM DEVICE - DO NOT OPEN"**
- **Report for bioassay**
- **Wipe test the area**
- **Restrict access to area until results from wipe test are received**

Double Bagging Procedures

- 1. Put on latex gloves
- 2. Put Item in plastic bag (seal with tape)
- 3. Put Item in second plastic bag (seal with tape)
- 4. Place gloves in radioactive waste container
- 5. Place Label on bag.



Double Bagging Procedures

- Label
  - Broken device _____
  - Containing _____
  - Contact RPO/RSO_____
  - Name_____
  - Date_____
  - ***Do Not Open***